



Kīholo Conservation Action Plan

DRAFT Report

June 2013

Strategies to guide conservation actions through cooperative partnerships



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| Acronym Key | |
|-------------|--|
| Acronym | Agency |
| ALKA | Ala Kahakai National Historic Trail, National Park Service |
| CAP | Conservation Action Plan |
| CI | Conservation International |
| DLNR | Department of Land and Natural Resources |
| HAK | Hui Aloha Kīholo |
| KEA | Key Ecological Attributes |
| NGO | Non-Governmental Organization |
| NPS | National Park Service |
| PT | Planning Team |
| State Parks | Hawai‘i DLNR Division of State Parks |
| TNC | The Nature Conservancy |

Quick Reference Summary

The Nature Conservancy led a three-day Conservation Action Plan (CAP) workshop at Kalaemanō, Hawai‘i Island from May 14-16, 2012. Our goals were 1) to engage and learn from local community and other partners in planning for our recently acquired lands and ponds at Kīholo, and 2) to ensure that we were planning and managing those lands and waters in the context of the larger region.

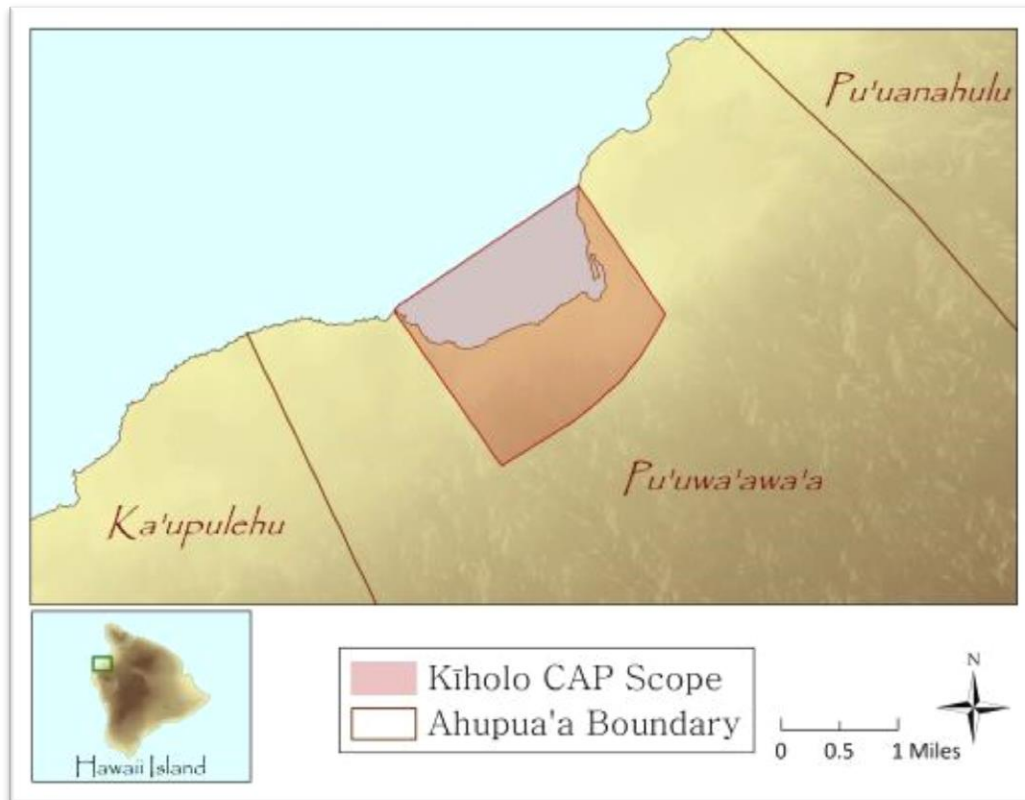


Figure 1. Geographic scope of Kīholo Conservation Action Plan.

Our collective vision is:

Planning Team Vision

Kīholo, a functioning and thriving ecosystem that supports a self-sufficient and sustainable future through adapting traditional natural resource management practices based on a sense of place, kinship, and kuleana.

Table 1. Kīholo Conservation Action Planning Participants

| Name | Affiliation |
|-----------------------------|------------------------------------|
| Bart Wilcox | Hui Aloha Kīholo |
| Chad Wiggins | The Nature Conservancy |
| Jason Philibotte | Conservation International |
| Jenny Mitchell | Hui Aloha Kīholo |
| Kanekoa Kukea-Shultz | The Nature Conservancy |
| Kim Hum | The Nature Conservancy |
| Ku'ulei Keakealani | Hui Aloha Kīholo |
| Luisa Castro | Hawai'i State Parks |
| Mahana Gomes | Hui Aloha Kīholo |
| Mike Donoho | Hui Aloha Kīholo |
| Nahaku Kalei | The Nature Conservancy |
| Rick Gmirkin | Ala Kahakai NHT NPS |
| Shalan Crysedale | The Nature Conservancy |
| Steven Victor (Facilitator) | The Nature Conservancy- Micronesia |

The seaward boundary of the CAP encompasses the current Kīholo Fisheries Management Area (FMA), and extends inland through public and private lands to Mamalahoa Highway, as illustrated below:

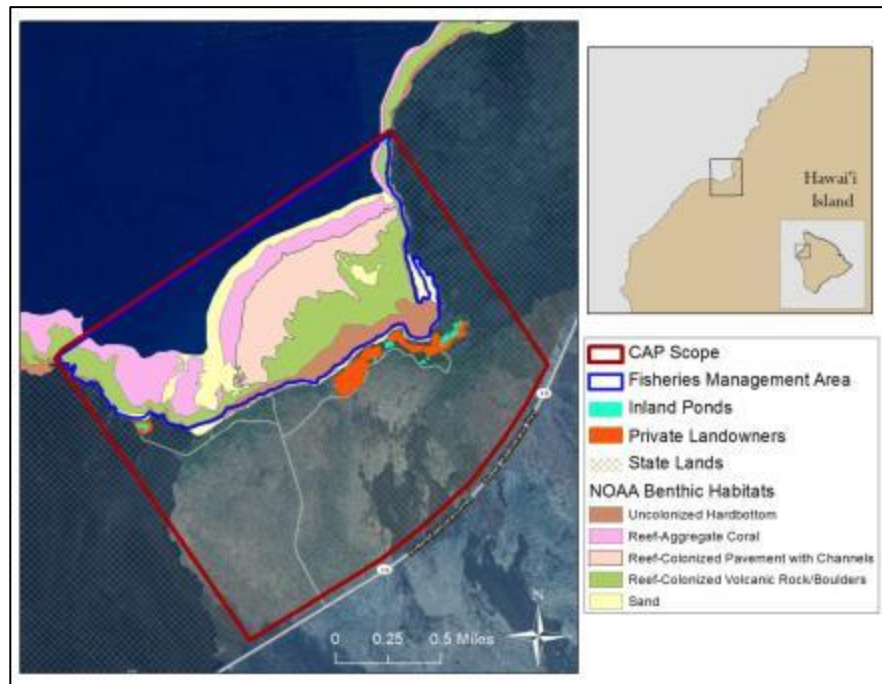


Figure 2. Kīholo landowners, fisheries management area, and coral reef habitat.

Key Points

1. **Kīholo is valuable** for many notable reasons: as a place where residents can recreate and gather food, as a destination for tourism on Hawai‘i Island, as a biologically significant coral reef system, and as a cultural treasure whose rich history demonstrates the incredible adaptability of people and nature to extreme events.
2. **Degradation and decline *are likely*** as a growing island population looks to Kīholo’s coastal and marine life to meet their needs.
3. **Engaged community members are eager** to support actions that address impacts to coastal and marine life to ensure perpetuation of cultural practices at Kīholo.
4. **Cooperative partnerships** at all levels are vital to implement strategies that address multiple threats to natural resources.
5. **Broad-based community participation and support** are important for implementation, long term success, and as valuable goals in their own right.
6. **Traditional practices of Kīholo** helped shape this place, and are still important to guide sound conservation action.
7. **Co-management is welcome and needed** to implement strategic actions in the region, support training and education, and build local capacity for long-term sustainability.

Participants analyzed and agreed on **nine priority conservation targets:**

**inland pond ● shoreline ● coral reef ecosystem ● reef food fish ● birds
native vegetation ● freshwater ● historical and cultural sites ● anchialine pools**

Priority CAP Strategy Summary

Kīholo’s conservation targets – those resources that define Kīholo and that the community has identified as the most important to protect and restore – have declined and are at risk of further degradation. Our collective goal is to implement the conservation strategies outlined below over the next ten years to address known threats to Kīholo’s conservation targets. Through this work, we will endeavor to honor the vision of Kīholo kūpuna and community members who wish to see their traditions and the place they care so much about thrive and sustain future generations.

Strategy 1: Restore Inland Pond System**1a: Remove Invasive Vegetation**

Why? *Kīholo's ponds once hosted an abundance of fish and bird life, but encroachment and habitat alteration by invasive plants over the past 50 years has altered this system.*

Objective: Build an ungulate exclosure fence, remove invasive plants, and replant with appropriate native plants within 1-acre restoration area adjacent to inland ponds by 2015.

1b: Restore Inland Pond Habitat

Why? *Kīholo's inland ponds are being degraded by sediment, primarily contributed by leaf litter from encroaching vegetation which reduces water quality and suitable habitat for estuarine fauna.*

Objective: Reduce sediment in three acres of inland ponds by 50% by 2015.

1c: Reconstruct Pond Walls

Why? *Intact walls facilitate bi-directional water flow, deter invasive species, demarcate clear boundaries around ponds to impede unnecessary access, and enable appropriate access for future restoration and management.*

Objective: Reconstruct 25% of historically documented walls, and repair and maintain 'auwai and makaha to enhance fisheries benefits, increase water flow, and improve sediment flushing in the pond by 2015.

Strategy 2: Increase Compliance

Why? *Illegal activities can negatively affect both ecological and cultural resources due to poaching, wildfire, or destructive misuse, and an increase in voluntary compliance with permitted activities will benefit the coastal ecosystems and the cultural sites of Kīholo.*

Objective: Increase compliance with natural and cultural resource rules and guidelines by 50% by 2015.

Strategy 3: Maintain Groundwater Flow

Why? *It is important to ensure water withdrawal from nearby development does not increase the salinity or reduce the volume of the life giving waters of Kīholo, due to the integral role groundwater plays in inland pond and nearshore ecosystem function and quality.*

Objective: Improve regulations to ensure groundwater quality and quantity is maintained at or above 2012 levels (12 million gallons per day), by 2020.

Strategy 4: Build Management Capacity**4a: Sustainable Financing**

Why? *In order to continue mutually beneficial co-management of Kīholo between the state and Hui Aloha Kīholo (501c3), sustainable revenue is needed to maintain ranger presence, provide targeted outreach, and support restoration activities.*

Objective: Secure sustainable financing for core staff and programs by 2020.

4b: Community-Based Management

Why? *Community engagement is a critical component of maintaining effective partnerships between the community, NGO's, government, business, and lineal descendants to effectively protect the conservation targets.*

Objective: Build and maintain effective partnerships by identifying groups to engage with, design and establish a network of community partners and strengthen local capacity to manage resources.

Strategy 5: Understand Changes in the Health and Use of Reefs, Fisheries and Fishponds

Why? *In order to better manage natural resources and human uses and ensure the effectiveness of strategies implemented in this plan, we need to understand their current health and abundance and changes in these conditions over time.*

Objective: Conduct annual coral reef and reef fish surveys, monthly fishpond surveys, and weekly human use surveys to understand current status and change over time.

Rationale

In May 2012, The Nature Conservancy (TNC) facilitated a conservation action planning (CAP) process for Kīholo (Figure 1 and 2) to develop partnership-driven strategies to care for Kīholo's natural and cultural resources, which share direct connections to both the mauka (mountain) lands of Pu'uwa'awa'a and the makai (ocean) waters of Kīholo Bay. The coastal and marine systems of Kīholo are significant resources that provide ecosystem services to people through supporting food gathering, cultural practice, shoreline protection, recreation, subsistence, diverse livelihoods, carbon cycling, and research.

Kīholo's natural resources, and the ecosystem services they provide, are at risk, as Hawai'i is experiencing the influence of human-induced drivers of decline and degradation that have led to losses of cultural and ecosystem values, and sustainable fisheries practices such as traditional management through kapu (prohibition) and kanawai (regulation), maintenance of loko 'ia (fishponds), imu (fish houses), and 'ōpelu ko'a (coastal open water fish farming areas). While these lost practices may be traced back to a number of causes, they may also be revived in a modern management context at Kīholo.

However, global climate change is likely to exacerbate current threats, exceeding the natural resilience of Hawai'i's coastal resources to resist chronic stressors and recover from severe events such as tsunamis, storms, and lava flows. In order to ensure the resilience of Kīholo's natural and cultural resources, it is vital that we develop and implement conservation actions to address known threats to maintain and restore coastal and marine life health before thresholds are crossed from which the system cannot naturally recover. Unique and important natural features and phenomena such as anchialine pools, estuaries, subterranean water sources, coastal vegetation, sandy embayments, coral reefs, and lava flows influence the health of Kīholo, and are themselves influenced by human activities such as shoreline hardening, water withdrawal, and increased, unsustainable use. This planning process was designed to give key stakeholders and community members the opportunity to develop and provide input on strategies to address threats, and, in doing so, to empower communities to care for local resources. The strategies developed in this process will be implemented by different partners, collectively and individually, and have the added benefit of building community capacity to adapt and manage global and local threats using both traditional and modern management techniques.

This plan is not designed to be static or final; indeed some strategies are already being implemented as this report is being finalized. When we re-visit the plan in the future, it will be adapted and refined, and the success or failure of implemented actions can inform better conservation at Kīholo and other sites across Hawai'i.

Kīholo Conservation Action Planning Process

Conservation Action Planning:

The Conservation Action Planning (CAP) process guides project teams to identify effective conservation strategies using a logical, iterative, and adaptive management planning model. It provides an objective, consistent and transparent accounting of conservation actions and the intended and actual outcomes of conservation projects. It enables project staff to responsively adapt their actions to improve strategy effectiveness and achieve greater conservation impact. (Attachment 1).



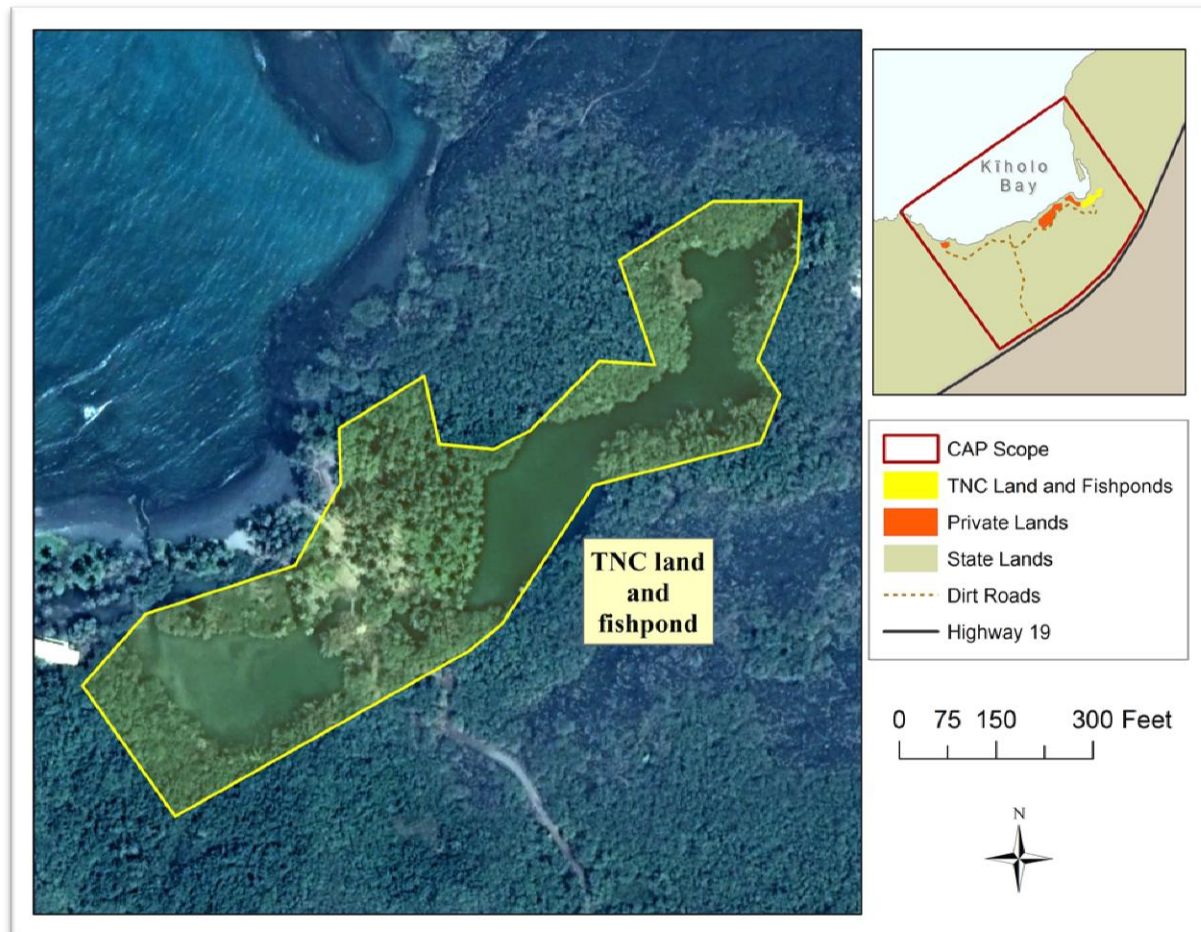
Kīholo CAP Process:

Figure 3. TNC land and fishponds at Kīholo.

The Planning Team (PT) was comprised of members of Hui Aloha Kīholo (HAK; a local non-profit organization), Ala Kahakai National Historic Trail (ALKA), TNC, Hawai‘i’s DLNR Division of State Parks (State Parks), and Conservation International’s Hawai‘i Fish Trust (CI) (Table 1). Hui Aloha Kīholo participants included shoreline and offshore fishermen, cultural practitioners, project managers, and individuals with kinship connections to Kīholo spanning hundreds of years.

TNC coordinated a three-day CAP workshop to identify conservation targets, threats affecting the conservation targets, and strategies to address priority threats (Attachment 2). For this plan, the project scope was defined by the planning team as encompassing all of the lands of Kīholo, with emphasis on strategies and actions focused on the TNC property and associated inland ponds (Figure 3).

The workshop meeting of the PT occurred from May 14-16th, 2012 at the Ka'ūpūlehu Interpretive Center on the Kona Coast of Hawai'i Island (Figure 4), and was facilitated by Steven Victor, who has facilitated several ridge to reef CAP's throughout Micronesia. Over these three days, the PT defined focal **conservation targets** (Table 2) and evaluated these targets using **viability** tools standard to CAP (Table 3). The PT evaluated the **Key Ecological Attributes** (KEA's) for each target as a means to evaluate viability. KEAs are aspects of targets that, if missing or altered, lead to the loss of that target over time (e.g. native vegetation). These KEA's were used to develop **primary indicators** (measurable criteria related to a specific information need) for each target (e.g. traditional cultural uses of plants). Next, the Planning Team developed a range of values for each indicator on a scale of *Very Good > Good > Fair > Poor*. Team members estimated the current status of each target based on this range, or noted areas that needed additional information.

CAP Terminology

Conservation Targets: *What do we want to care for?*

Viability: *How are the things we want to care for doing?*

Key Ecological Attributes: *Aspects of the conservation target that if missing or altered lead to the loss of that target over time.*

Primary Indicators: *Measurable criteria for each target*

Critical Threats: *What impacts the things we want to care for?*

Strategies: *Actions to mitigate threats to maintain or improve health of identified conservation targets.*

The PT also identified **critical threats** to Kīholo conservation targets (Table 4), and evaluated their impact based on four criteria: *Scope, Severity, Irreversibility, and Contribution*. At the conclusion of this three-day workshop, the PT defined and evaluated eleven conservation targets, with nine deemed as priorities, and eight threats (Table 5).

Once the threats were ranked, the PT identified the highest priority threats based on the ranking process to identify **strategies** to mitigate these threats to maintain and or improve the health of the identified conservation targets. The PT discussed goals for each of the conservation targets but only discussed strategies for threats and targets related to the TNC-owned property and ponds. The participants realized that there were not enough people present at the workshop representing the broad stakeholder groups who needed to be involved in discussion of strategies for managing all of Kīholo's target resources. The PT did agree that strategies identified for TNC-owned property may be applicable beyond the

property. The consensus was that Hui Aloha Kīholo would be the main partner to engage with other partners and stakeholders to move the planning process forward. Another follow up meeting will be necessary to further discuss strategies and actions beyond TNC's lands and ka loko o Kīholo.

Once the strategies were identified, they were ranked through simple vote of choosing which of the strategies the participants of the workshop believed would have the most impact on managing Kīholo to meet the vision of PT (Figure 3).

Process Summary

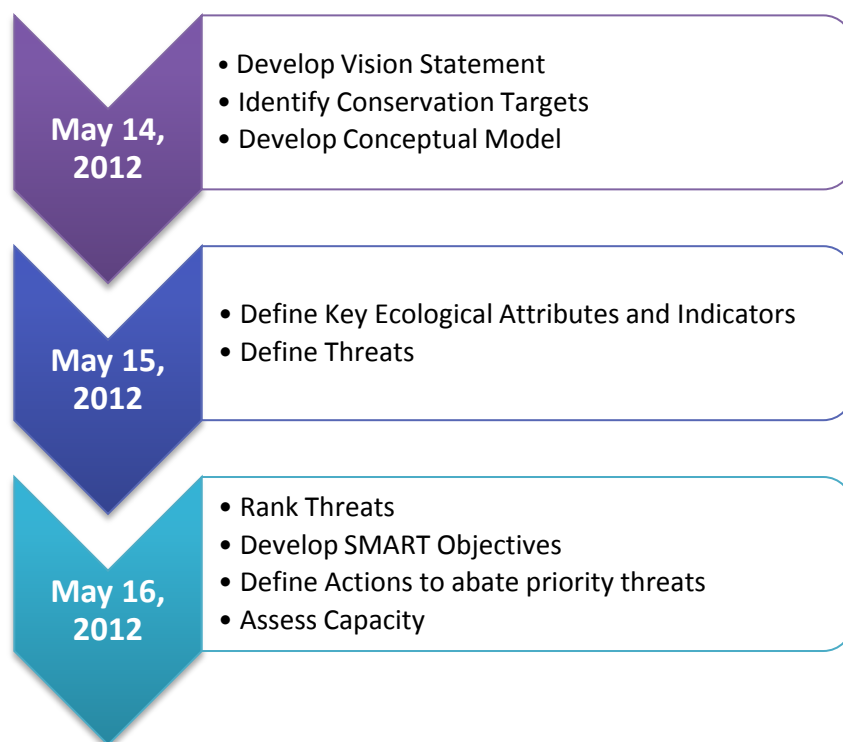


Figure 4. CAP Participatory Process Summary

Kīholo CAP Targets and Definitions

During the three-day workshop, the PT develop and defined nine priority targets (Table 2). In addition to these nine targets, the PT initially identified two additional targets: 1) Aesthetic, and 2) Fishing Community/Fishing Practice. However, during the discussion of viability criteria, the PT determined it was not feasible to define the viability of these additional proposed targets, because they are dependent on the natural resource targets already identified. For example, healthy fishing practice is predicated upon healthy reef food fish populations, and

could not be considered independently. Therefore, it was agreed that these important community values are integrated throughout this plan and specifically incorporated into the goals for the conservation targets, threat abatement strategies, and plan evaluation through socio-economic indicators.

Table 2. Kīholo CAP Targets and Definitions

| Target | Definition |
|--------------------------------------|--|
| Anchialine pools | Land-locked bodies of water of varying salinity with indirect, underground connections to the sea. |
| Birds | These include migratory geese & Kōlea (Pacific Golden Plover), Kōloa (Hawaiian Duck), Aukū‘u (Black Crowned Night Heron), Ae‘o (Hawaiian Stilt), and Kioea (Bristle Thigh Curlew). |
| Coral Reef Ecosystem | The coral reef and the marine life that it supports. |
| Fresh water | Freshwater flowing underground into and through caves, ponds and reefs. |
| Historical and cultural sites | Water caves, ko‘a, trails, Luahinewai, and Keanalele. |
| Inland ponds | Fishponds with surface connection to the ocean. |
| Native Vegetation | Including native ground cover and shrubs as well as hau, kou, milo, and naupaka. |
| Reef Food Fish | Including Kōle (Goldring Surgeonfish), Pauku‘iku‘i (Achilles Tang), and Uhu (Parrotfish). |
| Shoreline | Rocky and sandy habitats, cliffs, ‘ili‘ili beaches, honu (turtle) resting areas; native coastal vegetation, and niu (coconut) grove. |



Kīholo CAP Target Viability (Health)

In order to have an understanding of the health and viability of each CAP target, participants developed a list of metrics that represent the Key Ecological Attributes (KEA's) for each target, and measurable indicators for each KEA. Each KEA represents a characteristic of that target that defines its biological and cultural value. Degradation of each KEA represents the gradual loss of target health and function.

Measurable indicators were used to evaluate the KEA and health of the target. Each indicator includes a range of health ratings from *poor* to *very good*, with measurable values associated with each rating where possible (Table 3). In some cases, indicators and current status were agreed upon, but the teams acknowledged that additional information was necessary to define the ratings. The goal for successful conservation action is to shift target status up one or more levels (e.g. from *fair* to *good*).



Examples of Key Ecological Attributes (KEA's) of conservation targets include 1) the presence of native food fish in the fishponds and on the reef, 2) an abundance of native plants, or 3) the integrity of historical and cultural sites.

Table 3. Target Viability showing overall status and key ecological attributes with their indicators and status.

| Target | Overall Status | Key Ecological Attributes | Indicator | Poor | Fair | Good | Very Good |
|-------------------------------|----------------|----------------------------------|--|----------------|---------|---------|----------------|
| Anchialine Pools | Poor | Population structure of Opae'ula | Presence of Opae' ula (% of ponds) | 0-24 % | 25-49 % | 50-74 % | 75-100 % |
| Birds | Poor | Population Structure | Native Bird Species Diversity (# of species) | < 2 | 2-5 | 6-10 | ≥10 |
| Coral Reef Ecosystem | Fair | Coral Population structure | Live Coral Cover (%) | 0-24 % | 25-49 % | 50-74 % | 75-100 % |
| | | | Size Distribution | One size range | | | Range of sizes |
| Freshwater | Good | Water Quality | Presence/absence of E. coli | If present | | | If absent |
| | | Water Quantity | Groundwater Flow | Rate decreases | | | 2012 rate |
| Historical and Cultural Sites | Fair | Site Condition | Integrity of Structure | | | | |
| | | Site Management | Actively Managed Sites (% of total) | 0-24 % | 25-49 % | 50-74 % | >75 % |
| | | Historical/cultural value | Integrity | | | | |
| Inland Ponds | Fair | Pond Food Fish | Number of Fish Caught from Pond | | | | |
| | | Salinity Gradient | Salinity | | | | |
| Native Vegetation | Poor | Native vegetation composition | Native Vegetation in restored areas | 0-24 % | 25-49 % | 50-74 % | 75-100 % |
| | | | Traditional Cultural Uses of Plants | absence | | | presence |
| Reef Food Fish | Fair | Population structure | Sightings from shore | | | | |
| | | | Biomass | | | | |
| | | | CPUE | | | | |
| Shoreline | Fair | Native species assemblage | Number of people gathering responsibly | | | | |
| | | | Distribution of culturally/traditionally collected species | | | | |

Kīholo CAP Threats and Definitions

Table 4. CAP threats and definitions

| Threat | Definition |
|-------------------------------------|---|
| Illegal activities | Trespassing and harvesting that is not permitted in certain areas. |
| Human Waste | Lack of proper restroom facilities on public lands has caused human waste and waste products (e.g. toilet paper and diapers) to become prevalent across the landscape, causing a concern to human health (presence of the bacteria <i>E.coli</i>) as well as to sensitive cultural sites. |
| Tsunami | The geographic location and low elevation of the inland ponds at Kīholo make them vulnerable to damage by tsunami, with recent damages observed in March 2011. |
| Wildfire | Fire that results from arson or illegally using fire pits in prohibited areas. |
| Anchoring | Damage to the reefs as a result of anchoring by ships. |
| Overharvesting | Harvesting of resources beyond their capacity to recover naturally. |
| Invasive Plants | Non-native or invasive terrestrial and marine plants, including kiawe and certain types of limu (seaweed or algae) that could be indicators of changes in water quality. |
| Ungulates | Ungulates (primarily goats) are largely unmanaged within Hawaii State Parks land at Kīholo, and pose a threat to native plant restoration efforts on public and private lands. |
| Invasive Fish | Invasive fish fecal matter within inland ponds adds to sedimentation, and includes tilapia, to'au, and ta'ape. Roi on the nearshore reef predate on juvenile food fish and invertebrates. |
| Sedimentation | Accumulation of sediment in ponds as a result of fish waste and organic materials from overhanging vegetation. |
| Non-native predatory animals | Includes mongoose, cats, rats and mice which predate on native birds. |
| Drought | Reduced water table recharge due to drought may lead to decreased fresh water supply to coastal areas via springs, and adversely affect the inland ponds and nearshore marine habitat. |
| Trampling | Natural severe weather events (e.g. hurricanes, large swells, and tsunamis) or human use such as hiking, wading, tromping, or driving over vegetation. |
| Sea Level Rise | Seawater intrusion and inundation into coastal areas due to climate change induced sea level rise. |
| Water Withdrawal | Removal of groundwater by neighboring development for irrigation and drinking water, which could lead to reduced groundwater levels, salt water intrusion, and a decline in habitat quality for nearshore ecosystems that depend on groundwater inputs (e.g. anchialine pools, inland ponds, and nearshore marine systems). |

Kīholo CAP Threat Rankings

The known impact of each threat was evaluated for each target individually using rankings standard to CAP (Attachment 4). Each threat was considered based on the **source**, or the proximate activities or processes that directly have caused, are causing, or may cause the destruction, degradation and/or impairment of conservation targets (e.g. grazing by feral ungulates), and the **stress**, or impact that result directly or indirectly from the source (e.g. increased sedimentation).

Sources of stress were evaluated based on two criteria: **contribution**, or the expected influence of the source alone to the full expression of a stress under current circumstances, and **irreversibility**, or the reversibility of the stress caused by the source of stress.

Stresses were further evaluated based on two criteria: **severity**, the level of damage to the conservation resource that can be reasonably expected within 10 years under current circumstances, and **scope**, or the geographic fingerprint of impact on the conservation resource at the site that can be reasonably expected within 10 years under current circumstances.

All four of these criteria were ranked on a four-point scale (*very high* > *high* > *medium* > *low*) for each target based on discussion and consensus among members of the PT (Table 5).

Some threats, such as *anchoring*, may only directly influence a few targets, while others, such as *water withdrawal* have potential to impact many targets. Overall threat ranking is a function of both the ranking of each target/threat interaction and the number of targets a threat influences. This ranking was considered when prioritizing strategic objectives. One or more objectives were developed to reduce each priority threat and used as a guide to draft initial strategies during the CAP workshop. These threat rankings can be re-evaluated over time based on better information and to determine whether management actions are being effective.

The result of this collaborative and systematic ranking process resulted in three very high and five high priority threats that measurably impact multiple targets:

| Very High Priority Threats | High Priority Threats |
|----------------------------|-----------------------|
| Invasive Plants | Illegal Activities |
| Drought | Sea Level Rise |
| Water Withdrawal | Overharvest |
| | Ungulates |
| | Sediment |

Table 5. Threat rankings for Kīholo conservation targets. Greyed out boxes indicate threat does not apply to this target, “Not specified” indicates that not enough information is available to make a threat ranking at this time.

| Conservation Targets Threats | Anchialine Pools | Birds | Coral Reef Ecosystem | Freshwater | Historical and Cultural Sites | Inland Ponds | Native Vegetation | Reef Food Fish | Shoreline | Summary Threat Rating |
|---------------------------------|------------------|--------|----------------------|---------------|-------------------------------|---------------|-------------------|----------------|---------------|-----------------------|
| Invasive Plants | High | - | - | Medium | High | Very High | High | - | Low | Very High |
| Drought | Very High | - | High | Very High | - | Very High | Medium | - | - | Very High |
| Water Withdrawal | Very High | - | Medium | Very High | - | Very High | - | - | Medium | Very High |
| Illegal Activities | - | - | Low | - | - | High | - | High | High | High |
| Sea Level Rise | Medium | - | Not Specified | Medium | Medium | High | Medium | Not Specified | High | High |
| Overharvest | Low | - | High | - | - | High | - | High | High | High |
| Ungulates | Medium | - | - | Low | High | Low | Very High | - | - | High |
| Sediment | High | - | - | Low | Not Specified | High | Not Specified | - | Medium | High |
| Invasive Fish | High | - | - | Not Specified | Not Specified | Low | Low | - | - | Medium |
| Wildfire | - | - | - | - | Low | - | High | - | - | Medium |
| Non-native predatory mammals | Not Specified | High | - | Not Specified | Not Specified | Not Specified | Not Specified | - | - | Medium |
| Trampling | Low | - | Low | - | Medium | - | Medium | - | High | Medium |
| Human Waste | Low | - | - | Medium | Low | - | - | - | - | Low |
| Tsunami | Not Specified | - | Not Specified | Not Specified | Not Specified | Not Specified | Not Specified | Not Specified | Not Specified | Not Specified |
| Anchoring | - | - | Not Specified | - | - | - | - | Not Specified | - | Not Specified |
| Summary Target Ratings: | Very High | Medium | High | Very High | High | Very High | High | High | High | Very High |

Kīholo CAP Strategies

In order to develop strategies to combat threats, specific **goals** were identified for each target. Each goal relates to the desired condition of a conservation target. For each goal, strategies and actions for abating the priority threats for each target were identified in the context what needs to be done to mitigate the threats to achieve each goal. Participants defined at least one **goal** for each target, and developed one or more **objectives** to reduce the impact of each priority threat to target viability. These objectives were used to draft initial strategies. Strategies were then ranked and actions for the top strategies were initially identified in this workshop.

Eight threats emerged as priorities for Kīholo: *water withdrawal, drought, invasive plants, overharvesting, ungulates, sediment, sea level rise, and illegal activities*. It was decided that water withdrawal and droughts are threats that are very important to mitigate, addressing them requires strategies that must focus beyond the project scope and the purpose of this plan, and these threats will be considered when possible. Addressing these threats locally is likely to increase resilience to the effects of global climate change, which is predicted to increase the frequency and severity of drought events. Separate strategies for dealing with invasive plants and ungulates share many components, but differ in removal method.

Each priority strategy is presented below in two components: 1) the desired outcome or objective and 2) the actions that are essential and sufficient to achieving the outcome, assuming all actions are successfully implemented. Each strategy was rigorously reviewed to meet internationally recognized “SMART” planning criteria (Specific, Measurable, Achievable, Relevant, and Time-bound).

Goal

A goal relates to the desired condition of a conservation target.

Objective

Each objective is developed to address the impact of a priority threat on one or more conservation targets.

Specific

Measurable

Achievable

Relevant

Time-bound

| Strategy 1: Restore Inland Pond System | |
|---|---|
| 1a: Remove Invasive Vegetation | |
| Objective: Build an ungulate enclosure fence, remove invasive plants, and replant with appropriate native plants within 1-acre restoration area to inland ponds by 2015. | Actions: <ol style="list-style-type: none"> 1. Build a 1 acre ungulate enclosure fence in priority areas adjacent to inland ponds 2. Propagate and plant appropriate native vegetation that provides suitable habitat for native birds. 3. Maintain zero ungulates within enclosure areas |
| 1b: Restore Inland Pond Habitat | |
| Objective: Reduce sediment in three acres of inland ponds by 50 % by 2015. | Actions: <ol style="list-style-type: none"> 1. Obtain necessary permits from OCCL, ACOE, Hawai'i County, and others. 2. Mechanically remove sediment in the pond to improve water quality and to provide habitat for fish and plants. 3. Remove/maintain vegetation surrounding the pond to minimize the accumulation of new sediment. 4. Remove tilapia in the pond to reduce sediment from fecal matter. |
| 1c: Reconstruct Pond Walls | |
| Objective: Reconstruct 25% of historically documented walls, and repair and maintain 'auwai and makaha to enhance fisheries benefits, increase water flow, and improve sediment flushing in the pond by 2015. | Actions: <ol style="list-style-type: none"> 1. Repair and maintain auwai and makaha to increase water flow within pond to improve flushing of sediment in the pond. 2. Reconstruct 25% of historically documented pond walls to improve invertebrate habitat, reduce sediment delivery, manage access, and reduce grazing. |
| Strategy 2: Increase Compliance | |
| Objective: Increase compliance with natural and cultural resource rules and guidelines by 50% by 2015. | Actions: <ol style="list-style-type: none"> 1. Increase understanding of frequency of trespassing and illegal activities within the TNC owned property. 2. Increase understanding of uses of Kīholo Bay. 3. Increase visitor's awareness of permitted activities through increased signage. 4. Encourage voluntary compliance through 24 hour presence. 5. Determine who has legal authority for management of ponds and waterways. |

| Strategy 3: Maintain Groundwater Flow | |
|--|--|
| Objective: Improve regulations to ensure groundwater quality and quantity is maintained at or above 2012 levels (12 million gallons per day) , by 2020. | Actions: <ol style="list-style-type: none"> 1. Designate freshwater as a cultural resource under the National Historic Preservation Act and Hawai‘i’s Historic Preservation Program. 2. Increase understanding of hydrology of underground water. |
| Strategy 4: Build Management Capacity | |
| 4a: Sustainable Financing | |
| Objective: Secure sustainable financing for core staff and programs by 2020. | Actions: <ol style="list-style-type: none"> 1. Revenue generation through invasive plant or animal removal. 2. Revenue generation through managed farming. |
| 4b: Community-Based Management | |
| Objective: Build and maintain effective partnerships by identifying groups to engage with, design and establish a network of community partners and strengthen local capacity to manage resources. | Actions: <ol style="list-style-type: none"> 1. Identify groups to engage with. 2. Design and establish a network of community partners. 3. Strengthen local capacity to manage. |
| Strategy 5: Understand Changes in Health and Use of Reefs, Fisheries and Fishponds | |
| Objective: Conduct annual coral reef and reef fish surveys, monthly fishpond surveys, and weekly human use surveys to understand current status and change over time. | Actions: <ol style="list-style-type: none"> 1. Train community members in survey techniques to build local capacity to monitor resources. 2. Establish annual, monthly, and weekly schedule to monitor changes over time. |

Kīholo CAP Measures

The PT will need to be able to demonstrate the success or failure of conservation actions using reliable metrics. Future meetings with the PT will be arranged to identify measures that could be used to evaluate target health or threat abatement and strategy implementation in order to determine the success of conservation actions and adapt, adjust, halt, or scale up implementation. Two different sets of measures will be developed:

1. **Status measures** to evaluate changes in the health of the priority target resources.
2. **Strategy effectiveness measures** to evaluate the impact of the conservation actions on abating the priority threats and achieving the strategy outcomes.

The PT is committed to increasing public/private sector partnerships to expand opportunities implementation of CAP strategies. Each of these strategies will need to be evaluated with agreed upon measures by knowledgeable parties if progress toward CAP objectives is to be evaluated, and each measure could constitute a project in its own right. Several agencies and organizations are conducting monitoring programs in Kīholo at present and would likely benefit from enhanced coordination of activities and data to answer questions at different scales. In order to manage implementation of the CAP itself, it will be vital to have focused coordination of activities in partnership with individuals, groups, and agencies engaged in implementation.

Kīholo CAP Outputs

- **Five fully reviewed and prioritized conservation** strategies to address threats to coastal and marine life in Kīholo
- **A dynamic partnership** committed to implementation
- **13 member participant network**

The three day workshop of the Kīholo CAP established a firm foundation based on cooperation, collaboration, partnership, and mutual respect. It focused firmly on developing and implementing a plan that meets both ecological and socio-cultural goals for Kīholo. The commitment and participation of the Planning Team continues to finalize the first iteration of this plan and begin implementing priority strategies.

Additional meetings to identify potential partners who could lead specific strategies and actions, and expand the focus area to include the full scope of the CAP will continue. As additional partners come on board, this plan will continue to build momentum and leverage on-the-ground and in-the-water action for the benefit of people and the environment.

Acknowledgements: Each and every participant listed in this document has been a constructive and valuable supporter of the process, and their time, commitment, perspective, and willingness to share are solely responsible for success. Without taking anything away from these amazing participants, additional individuals were instrumental in making this process possible including: Angus Mitchell, Sonny Keakealani, Suzanne Case, Bobby Camara, Paola Pagan, Dickie Matsumoto, Aunty Shirley, and Aunty Leina‘ala Lightner,

Attachment 1 Conservation Action Planning Overview

Conservation Action Planning



Conservation Action Planning (CAP) is a powerful process to guide conservation teams to develop focused strategies and measures of success. CAP is The Nature Conservancy's version of the "Open Standards for Conservation". It has been utilized with hundreds of diverse projects at multiple scales from different parts of the world and is supported by a network of trained professionals that make up the Conservation Coaches Network.

The CAP process guides project teams to identify effective conservation strategies. It provides an objective, consistent and transparent accounting of conservation actions and the intended and actual outcomes of conservation projects. It enables project staff to responsively adapt their actions to improve strategy effectiveness and achieve greater conservation impact.

A brief summary of the CAP Process is provided below. For a full set of CAP and Open Standards information, visit http://conserveonline.org/workspaces/cbdgateway/cap/index_html.

THE 10 STEPS OF THE CAP PROCESS

1. Identify People Involved In Your Project

This step asks you to identify your most valuable resource – the people who will be involved in designing and implementing your project. Addresses questions like: ♦ *"Who will design our project?"* ♦ *"Who will be responsible for ensuring the plan goes forward?"* ♦ *"Who can give us advice?"* ♦ *"Who will help us through this process?"*

2. Define Project Scope & Focal Conservation Targets

With this step you define the extent of your project and select the specific species and natural systems that your project will focus on as being representative of the overall biodiversity of the project area. This step helps your project team come to consensus on the overall goal and scale of the project and your ultimate measures of success. Addresses questions like: ♦ *"Where is our project?"* ♦ *"What are we trying to conserve or restore?"*



3. Assess Viability of Focal Conservation Targets

This step asks you to look at each of your focal targets carefully to determine how to measure its “health” over time. And then to identify how the target is doing today and what a “healthy state” might look like. This step is the key to knowing which of your targets are most in need of immediate attention, and to measuring success over time.

Addresses questions like: ♦ *“How do we define ‘health’ (viability) for each of our targets?”* ♦ *“What is the current status of each of our targets?”* ♦ *“What is our desired status for each of our targets?”*

4. Identify Critical Threats

This step helps you to identify the various factors that immediately affect your project’s focal targets and then rank them so that you can concentrate your conservation actions where they are most needed. Addresses questions like:

♦ *“What threats are affecting our targets?”* ♦ *“Which threats are more of a problem?”*

5. Conduct Situation Analysis

This step asks you to describe your current understanding of your project situation – both the biological issues and the human context in which your project occurs. This step is not meant to be an unbounded analysis, but instead probes more deeply into the conditions surrounding your critical threats and degraded targets to bring explicit attention/consideration to causal factors, key actors, and opportunities for successful action. Addresses questions like: ♦ *“What factors positively & negatively affect our targets?”* ♦ *“Who are the key stakeholders linked to each of these factors?”*

6. Develop Strategies: Objectives and Actions

This step asks you to specifically and measurably describe what success looks like and to develop practical and *strategic* actions you and your partners will undertake to achieve it. In particular, you want to try to find the actions that will enable you to get the most impact for the resources you have. Addresses questions like: ♦ *“What do we need to accomplish?”* ♦ *“What is the most effective way to achieve these results?”*

7. Establish Measures

This step involves deciding how your project team will measure your results. This step is needed to help your team see whether its strategies are working as planned and thus whether adjustments will be needed. It is also needed to keep an eye on those targets and threats that you are not acting on at the moment, but may need to consider in the future. Addresses questions like: ♦ *“What do we need to measure to see if we are making progress towards our objectives and whether our actions are making a difference?”* ♦ *“Are there other targets or threats that we need to pay attention to?”*

8. Develop Work Plans

This step asks you to take your strategic actions and measures and develop specific plans for doing this work as your project goes forward. Addresses questions like: ♦ *“What do we specifically need to do?”* ♦ *“Who will be responsible for each task?”* ♦ *“What resources do we need?”*

9. Implement

Action and monitoring plans won’t do any good sitting on the shelf – your challenge here is to trust the hard work you have done and implement your plans to the best of your ability. Implementation is the most important step in this entire process; however, given the diversity of project needs and situations, the only requirement is: ♦ *Put your plans into action*

10. Analyze, Learn, Adapt, & Share

This step first asks you to systematically take the time to evaluate the actions you have implemented, to update and refine your knowledge of your targets, and to review the results available from your monitoring data. This reflection provides insight on how your actions are working, what may need to change, and what to emphasize next. This step then asks you to document what you have learned and to share it with other people so they can benefit from your successes and failures. Addresses questions like: ♦ *“What are our monitoring data telling us about our project?”* ♦ *“What should we be doing differently?”* ♦ *“How will we capture what we have learned?”* ♦ *“How can we make sure other people benefit from what we have learned?”*

Attachment 2 –Workshop Agenda

Draft Agenda

Kīholo Conservation Action Planning Workshop

Dates: May 14-16, 2012

Ka'ūpūlehu Interpretive Center at Kalaemanō

Proposed Goals for the workshop:

1. Introduce Kīholo participants to Conservation Action Planning (CAP) process
2. Complete a credible first iteration of a conservation action plan
3. Determine whether Kīholo requires a resource management plan and agree on process to draft a management plan, if needed

Expected Workshop Outputs:

1. Confirmed list of focal conservation targets, including an assessment of their viability, for Kīholo's Natural and Cultural Resources
2. Identification and ranking of critical threats affecting the focal targets
3. Preliminary list of strategic objectives and actions to abate threats and /or enhance the viability of targets
4. Practical success indicators for threats and/or targets
5. Self-assessment of Kīholo's readiness/capacity to implement this conservation action plan
6. Identification of a clear process to incorporate the results of the CAP into a comprehensive Natural Resources Management Plan for Kīholo

| Monday, 14 May | | |
|--------------------------|---|---|
| 9:00 am -10:00 am | Participant introductions (<i>15 minutes</i>) Introduction to the CAP process how the CAP results can be integrated into the Management Plan (<i>45 Minutes</i>) | Group discussion Steven - PowerPoint presentation |
| <i>10:00-10:15 am</i> | <i>Coffee Break</i> | |
| 10:15 am-12:00 pm | Develop our Vision and Identify and Map Conservation Targets What is the overall vision for the site? What are the special features and resources that make Kīholo a special place? What are we trying to conserve or restore? | Steven - PowerPoint presentation introduction and group brainstorm and discussion |
| <i>12:00 pm -1:30 pm</i> | <i>Lunch</i> | |

| | | |
|---------------------------|--|---|
| 1:30 pm -3:30 pm | Conceptual model (i.e. what are the socio-economic and environmental factors affecting the resource?) making the linkage between factors that cause existing threats that degrade the focal conservation targets | Group discussion and exercise using colored cards. |
| <i>3:30 pm-3:45 pm</i> | <i>Break</i> | |
| 3:45 pm – 4:15 pm | Review Day 1 and Prep for Day 2 | Plus / delta feedback exercise (What works and what needs to improve?) |
| Tuesday, 15 May | | |
| 9:00 am -10:30 am | Assessing the Viability of our Conservation Targets Define Key Ecological Attributes and indicators | PowerPoint presentation on Viability Group discussion and group begins to work with MIRADI |
| <i>10:30 am -10:45 am</i> | <i>Break</i> | |
| 10:45 am -12:00 pm | Assess the Viability of our Targets (cont'd) | Group discussion & works with MIRADI |
| <i>12:00 pm -1:30 pm</i> | <i>Lunch</i> | |
| 1:30 pm -4:30 pm | Review of Threats: Stresses and Sources using conceptual diagram Threat Ranking | PowerPoint presentation and ranking using Miradi |
| <i>3:15-3:30</i> | <i>Break</i> | |
| 4:30 pm -4:45 pm | Review Day 2 and Prep for Next Workshop | Plus / delta (What works and what needs to improve?) |
| Wednesday, 16 May | | |
| 9:00 am – 9:30 am | Review of viability and threat rankings | Power point presentation and group discussion |
| 9:30 am - 10:00 am | Overview of result chain | Power Point presentation |
| <i>10:00 am -10:15 am</i> | <i>Break</i> | |
| 10:15am - 12:00 pm | Define key intermediate results needed to be achieved to abate priority threats | Group discussion and creating result chain in Miradi |
| <i>12:30 pm – 1:30 pm</i> | <i>Lunch</i> | |
| 1:30 pm - 4:30 pm | Developing SMART Objectives to achieve key intermediate results and listing of strategic Actions continue | Group discussion and continue and inputting data in MIRADI |
| <i>3:00 pm – 3:15 pm</i> | <i>Break</i> | |
| 4:30 pm – 5:00 pm | Capacity Assessment Next steps | Discuss challenges and needs to implement |

More Information

CAP Resources http://conserveonline.org/workspaces/cbdgateway/cap/resources/index_html

Planning Software <https://miradi.org/>

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|----------------|------------------------------------|--|
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Attachment 3 - Food Resource Fish (from Williams et al. 2009)

Table A1. ‘Target Fish’ taxa used in analyses.

| Family, Taxon | Family, Taxon |
|-----------------------------------|---|
| Surgeonfish - Acanthuridae | Snappers - Lutjanidae |
| <i>Acanthurus achilles</i> | <i>Aphareus furca</i> |
| <i>Acanthurus blochii</i> | <i>Aprion virescens</i> |
| <i>Acanthurus dussumieri</i> | |
| <i>Acanthurus leucopareius</i> | Goatfishes – Mullidae |
| <i>Acanthurus nigroris</i> | ALL |
| <i>Acanthurus olivaceus</i> | |
| <i>Acanthurus triostegus</i> | Big-Eyes – Priacanthidae |
| <i>Acanthurus xanthopterus</i> | ALL |
| <i>Ctenochaetus</i> spp. | |
| <i>Naso</i> spp. | Jacks – Carangidae |
| | ALL |
| Wrasse - Labridae | |
| <i>Bodianus albotaeniatus</i> | Soldier/Squirrelfish - Holocentridae |
| <i>Coris flavovittata</i> | <i>Myripristis</i> spp. |
| <i>Coris gaimard</i> | <i>Sargocentron spiniferum</i> |
| <i>Iniistius</i> spp. | <i>Sargocentron tiere</i> |
| <i>Oxycheilinus unifasciatus</i> | |
| <i>Thalassoma ballieui</i> | Barracuda – Sphyraenidae |
| <i>Thalassoma purpurum</i> | ALL |
| Parrotfish – Scaridae | Others |

| | |
|------------------------------|------------------------------|
| ALL | <i>Chanos chanos</i> |
| | <i>Cirrhitus pinnulatus</i> |
| Snappers - Lutjanidae | <i>Monotaxis grandoculis</i> |
| <i>Aphareus furca</i> | all Belonidae |
| <i>Aprion virescens</i> | all Scombridae |

Note: other families including Albulidae, Elopidae, Mugilidae, would normally be considered as targeted taxa, but were not recorded during FHUS surveys of 10-50ft deep hard-bottom habitats and are only rarely encountered in that habitat. Kyphosidae and zooplanktivorous triggerfish (*Melichthys* spp.) are also taken by fishers in Hawai'i, but were excluded from analyses due to extremely clumped distributions.

Attachment 4 – Threat Ranking Criteria

Ranking Stress: Severity

Severity of Damage -- the level of damage to the conservation resource that can reasonably be expected within 10 years under current circumstances (i.e., given the continuation of the existing situation).

- ☐ **Very High:** The stress is **likely to destroy** or eliminate the conservation resource over some portion of the resource's occurrence at the site.
- ☐ **High:** The stress is **likely to seriously degrade** the conservation resource over some portion of the resource's occurrence at the site.
- ☐ **Medium:** The stress is **likely to moderately degrade** the conservation resource over some portion of the resource's occurrence at the site.
- ☐ **Low:** The stress is **likely to only slightly impair** the conservation resource over some portion of the resource's occurrence at the site.

Ranking Stress: Scope

Scope of Damage -- the geographic scope of impact on the conservation resource at the site that can reasonably be expected within 10 years under current circumstances (i.e., given the continuation of the existing situation).

- ☐ **Very High:** The stress is likely to be **very widespread** or pervasive in its scope, and affect the conservation resource throughout the resource's occurrences at the site.
- ☐ **High:** The stress is **likely to be widespread** in its scope, and affect the conservation resource at many of its locations at the site.
- ☐ **Medium:** The stress is likely to be **localized** in its scope, and affect the conservation resource at some of the resource's locations at the site.
- ☐ **Low:** The stress is likely to be **very localized** in its scope, and affect the conservation resource at a limited portion of the resource's location at the site.

Ranking Sources of Stress: Contribution

Contribution -- expected contribution of the source, acting alone, to the full expression of a stress (as determined in the stress assessment) under current circumstances (i.e., given the continuation of the existing management/ conservation situation).

- ☐ **Very High:** The source is a **very large contributor** of the particular stress.
- ☐ **High:** The source is a **large contributor** of the particular stress.
- ☐ **Medium:** The source is a **moderate contributor** of the particular stress.
- ☐ **Low:** The source is a **low contributor** of the particular stress.

Ranking Sources of Stress: Irreversibility

Irreversibility -- reversibility of the stress caused by the Source of Stress.

- ☐ **Very High:** The source produces a stress that is **not reversible** (e.g., wetlands converted to a shopping center).
- ☐ **High:** The source produces a stress that **is reversible, but not practically affordable** (e.g., wetland converted to agriculture).
- ☐ **Medium:** The source produces a stress that **is reversible with a reasonable** commitment of resources (e.g., ditching and draining of wetland).
- ☐ **Low:** The source produces a stress that is easily **reversible at relatively low cost** (e.g., off-road vehicles trespassing in wetland).